

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date  
2 June 2005 (02.06.2005)

PCT

(10) International Publication Number  
**WO 2005/048998 A1**

(51) International Patent Classification<sup>7</sup>: **A61K 9/64, 9/62, 9/50, A23L 1/30, A23D 9/05, B01J 13/14**

VIC 3030 (AU). HEAD, Richard [AU/AU]; 10 Pulteney Street, Adelaide, S.A. 5000 (AU).

(21) International Application Number:  
**PCT/AU2004/001592**

(74) Agent: MISCHLEWSKI, Darryl; I P Strategies, P.O. Box 1254, Camberwell, VIC 3124 (AU).

(22) International Filing Date:  
22 November 2004 (22.11.2004)

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

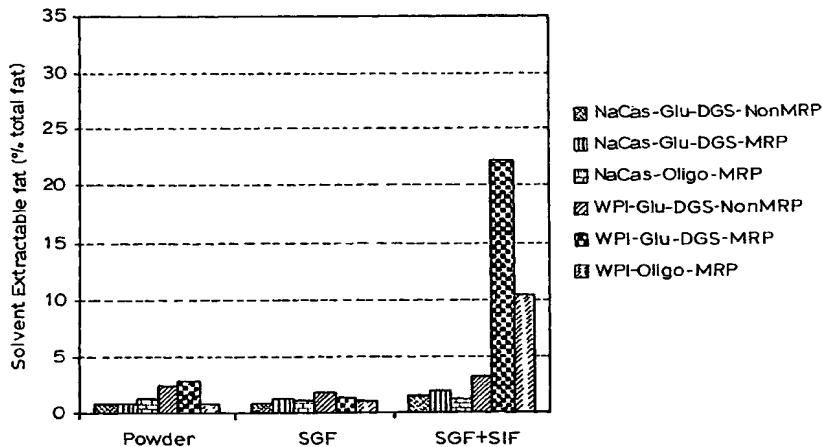
(26) Publication Language: English

(30) Priority Data:  
2003906417 21 November 2003 (21.11.2003) AU

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: G I TRACT DELIVERY SYSTEMS



(57) Abstract: A micro encapsulation material for use with storage unstable, therapeutic and nutritional agents which release the therapeutic and nutritional agents in predetermined locations in the gastro intestinal tract in which the encapsulation material is formed by combining a food grade treated carbohydrate with a water soluble food grade protein. The therapeutic and nutritional agents form an oil phase that is emulsified with the water dispersed or dissolved encapsulant to encapsulate the therapeutic and nutritional agents. These agents may be oils or oil soluble or oil dispersible. The agents that may be encapsulated include lipids (oils including oxygen sensitive oils, fatty acids, triglycerides) and oil soluble and oil dispersible ingredients (including pharmaceuticals, probiotics, protein therapeutics and bioactives). The protein used may include any film forming water soluble protein or hydrolysed protein and includes milk proteins such as casein and its derivatives or whey proteins. The carbohydrate component may be those containing reducing sugar groups, oligosaccharides and starches (raw, modified, resistant, acetylated, propionylated and butylated starches).

**BEST AVAILABLE COPY**

**WO 2005/048998 A1**



**Published:**

— *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*